

contact with each other and with non-conducting material; and so the book proceeds throughout its four hundred and sixty-seven disjointed articles, which were originally written as "Ideas from Port Shepstone" for the *Natal Mercury*.

W. E. ROLSTON.

### OUR BOOK SHELF.

*The Climber's Pocket Book. Rock-Climbing Accidents, with Hints on First Aid to the Injured, some Uses of the Rope, Methods of Rescue and Transport.* By Lionel F. West. Pp. 79; illustrated. (Manchester: The Scientific Publishing Co., n.d.) Price 2s. 6d. net.

ACCIDENTS are possible even to the most careful climbers, and they may happen in places from which a disabled man cannot readily be extricated. In such a case Mr. West's handy little book will be of the highest value, for his directions are terse, clear, and adapted to the various circumstances in which a mishap may be critical—on the face of a cliff, in a narrow gully or "chimney," when crags have to be climbed, or narrow ledges traversed before reaching a position which is easy of access. He explains and illustrates by photographs the different modes of using the rope, and how, by means of it, the disabled man may be lowered down precipitous rocks, transported across snow slopes, and carried on a stretcher, readily improvised, when the going becomes easy.

We are also told the symptoms indicating the nature of an injury, what to do and what to avoid, the articles of general equipment, and the few simple medicines and appliances which a climbing party should carry with them. That party, Mr. West rightly declares, should not number less than three; four is better, but more than that on a rope much retards progress, and the climbers in front, especially if the party be divided, may dislodge stones which imperil those in the rear.

If a man chooses to climb alone he must take the risks, for a simple fracture may then mean a lingering death; and two are not enough, for if assistance be needed the injured man must be left to pass hours, perhaps a night, in solitude. Frostbite, snow-blindness, and mountain sickness are described, with instructions for treating them, and Mr. West gives some valuable hints on the best way of avoiding mountain dangers, with a chapter of "don'ts," of which we must be content to say that, were it more generally followed, accidents would be far less frequent.

*What Rome was Built With. A Description of the Stones employed in Ancient Times for its Building and Decoration.* By Mary Winearls Porter. Pp. viii+108. (London and Oxford: Henry Frowde.) Price 3s. 6d. net.

EVERY intelligent visitor to Rome feels more or less curiosity about the varied stones that were used in such profusion for purposes of construction and decoration. Ordinary guides and guide-books are prone to err in the identification of the stones, and still more in any attempt to trace their origin or explain their formation. To deal adequately with the subject needs, in truth, the knowledge of both antiquary and geologist. The writer of this work, without professing any originality, has carefully collected from both sources a great deal of interesting information, and has examined critically several collections of typical specimens, with the result that she has produced a little volume that ought to be decidedly helpful to the inquirer.

The nomenclature of the ornamental stones employed by the ancients is often perplexing, leading occasionally to downright error. Even so common a term as "alabaster" is apt to be a source of some confusion, inasmuch as it is applied to both the carbonate and the sulphate of lime. Still more confusing is the use of the word "serpentine," for the antiquary often applies it to the green porphyry of Greece, a material very similar to the well-known rock of Lambay Island, near Dublin. On such points of terminology, as on other matters, the writer may be safely trusted, for her quotations show that she has not failed to consult the highest authorities.

A list of works of reference is appended, but its usefulness would have been increased if the dates of publication had been generally given. In the few cases where dates are quoted, accuracy is not always conspicuous. Thus a paper by R. Swan on Paros is here cited as having been read at the British Association in 1877, whereas on p. 83 the date is given as 1887; but, as a matter of fact, neither is correct, for the paper was read in 1889, and in Section C, not G, as here stated. A little more care might also have been well spent in the arrangement of the matter. What can be the use of explaining the meaning of the word "breccia" in a note on p. 50 when it has already been explained in words almost identical on p. 37? But these are only trifling blemishes, which detract but little from the value of an interesting compilation. It is difficult to point to any other work on the subject equally convenient and trustworthy.

*Nature's Hygiene and Sanitary Chemistry.* By C. T. Kingzett. Fifth edition. Pp. xvi+527. (London: Baillière, Tindall and Cox, 1907.) Price 7s. 6d. net.

THIS is a book written with a purpose, and the purpose is to proclaim the virtues of a certain disinfectant in which the author is interested. There is no secret about the matter; he shows us the axe he is grinding, and every now and then holds it up, as it were, that we may admire the nice sharp edge he is putting on the implement.

By "Nature's Hygiene" the author means the process of oxidation, as shown more especially in the absorption of moist atmospheric oxygen by certain terpenes, with the concurrent production of hydrogen peroxide and oxidised terpenes. Enormous quantities of these substances arise in forests; the peroxide destroys decaying vegetable matter, and the terpene-products act, in the author's view, as antiseptics.

The early chapters of the book deal with elementary chemistry, and lead up to the consideration of ventilation, fermentation, putrefaction, water supply, and the treatment of sewage. Thence we pass to theories of disease, and so on to the question of disinfection. Remembering that the author is writing for people who are presumed to be ignorant even of very elementary science, we may say, without endorsing all his opinions, that he gives an interesting and readable sketch of the various matters dealt with. It is marred, however, by vain repetitions; thus the author's views upon the question of whether microorganisms or their toxins are the *causa causans* of disease crop up about as often as King Charles's head did in the writings of Mr. Dick. Moreover, much of the book is ancient history; the footnotes teem with references to obsolescent matters dating back to the '70's and '80's of last century, whereas modern results are sometimes overlooked. Thus, although there are some notes upon argon and electrons, radium and radiobes, yet when we turn to the chapter on malarial fever to learn what our author has to say about the

work of Ross, Grassi, and others during the last few years, we find him talking of *Eucalyptus globulus*, and telling us that "Laveran and others claim that the disease is produced by certain microorganisms allied to the Flagellata, but this is contested by Tommasi-Crudeli." Certainly this is a book that requires to be read with discrimination. C. S.

*Étude sur les Foudroiements d'arbres constatés en Belgique pendant les Années 1884-1906.* By E. Vanderlinden. Pp. 79. (Bruxelles: L'Observatoire Royal de Belgique, 1907.)

A PHENOMENON of very frequent occurrence, and one that has been much studied, is the injury occasioned to trees by lightning, and yet we have no satisfactory explanation of the many difficulties that the problem presents. It must be admitted that these inquiries have not always been pursued on scientific lines, and the facts that have been collected and the theories that have been suggested need a thorough sifting and examination. This is the task to which M. Vanderlinden has applied himself with very considerable success. If he has not satisfied curiosity in all directions, he has at least overthrown some popular errors, limiting and indicating the field of strictly useful inquiry.

It has long been held that some trees are not liable to be struck by lightning. M. Vanderlinden examines this assertion, and finds that in Europe no kind of tree is free from this damage. Some kinds, such as the oak, the poplar, and some species of fir, are more frequently injured than others, but there are not sufficient data to show how far this result is effected by situation, by size, by exposure, or by the greater number cultivated. The causes which may be expected to influence the selective power of lightning are also investigated, but with only negative results. Among these we find the character of the soil, the chemical constitution of the timber, the proximity of water surface, the formation of the leaf, the shape of the tree, and particularly the character of the bark. In this last, the author thinks that possibly we have a source of explanation that has not been sufficiently examined. Trees possessing a smooth bark, such as beeches, are less liable to be struck than those having irregular, rugged, roughened surfaces, the external portions of which, becoming dry and dead, are bad conductors of electricity.

Other questions discussed are the manner in which lightning affects the tree, the character of the so-called spiral injuries, the actual combustion of the tree material, and the manner in which men and animals suffer injury when in the neighbourhood of trees that have been struck. The whole forms an admirable examination of a very scattered literature, and accurately exhibits the present position of an unexhausted inquiry. Detailed tables accompany the paper giving information concerning the locality, the number, and variety of trees, reported as being struck by lightning in the years under review.

*The Laws of Health. A Handbook on School Hygiene.* By Dr. Carstairs G. Douglas. Pp. vii+240. (London: Blackie and Son, Ltd., 1907.) Price 3s. net.

THIS should prove a useful book for school teachers and others interested in the important subject of school hygiene. Anatomical and physiological details are briefly dealt with, as the author justly remarks that there are several excellent manuals dealing with these subjects. On the other hand, the really important and fundamental portions of hygiene as applied to school life, such as ventilation, warming and lighting, and the fittings of the school buildings, the nutrition, ailments and deformities of the pupils, are discussed with sufficient fulness, and these sections are copiously

illustrated with diagrams and drawings. In dealing with fatigue, we are glad to see the stress the author lays on a proper amount of sleep, and that he ascribes a good deal of the listlessness and inattention, &c., met with in public elementary schools to deficient sleep. We have nothing but praise for the chapters on the slight ailments of children, the eye and ear, and infectious diseases; even the "fourth disease" is referred to. The only omission we have noted is a reference to the cleansing and periodical disinfection of school premises. R. T. H.

#### LETTERS TO THE EDITOR.

*[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.]*

#### The Wehnelt Kathode in a High Vacuum.

THE interesting experiments on the Wehnelt kathode in a high vacuum described by Mr. Soddy in NATURE for November 21, 1907 (p. 53), do not, I think, necessarily conflict with the experiments of either Dr. Wehnelt or myself, nor do they appear to vitiate the conclusions we drew from them.

The experiments by which Dr. Wehnelt showed that the negative leak from a lime-covered kathode was independent of the gas pressure were made with currents much smaller than those used by Mr. Soddy. When currents of the order of an ampere per square centimetre of kathode surface are obtained, the phenomenon appears to be accompanied by a glow round the kathode implying that ionisation in the gas itself is playing a part. Prof. J. J. Thomson ("Conduction of Electricity through Gases," second edition, p. 477) has shown that the potential fall required to produce ionisation by collisions with these large currents decreases rapidly as the current increases, so that even the comparatively small fall of 30 volts quoted from Wehnelt's paper would be sufficient to produce a considerable effect of this kind.

When the pressure of the gas falls below the value required to maintain this glow under the assigned conditions as to difference of potential, pressure, &c., there will be a sudden drop in the value of the discharge current. This appears to be what Mr. Soddy has observed.

I do not wish to imply that the negative emission is in all circumstances independent of the presence of gas in the tube. It is well known that the negative discharge from hot metals is particularly sensitive to hydrogen. In a recent paper (Phil. Trans., A, vol. ccvii., pp. 53 *et seq.*) I have described experiments which seem to prove conclusively that the leak from hot platinum is not due to traces of absorbed hydrogen. As the experiments in gases other than hydrogen show that the negative leak from hot platinum is independent of the pressure at low pressures, it is very unlikely that it is caused primarily by traces of any other of the common gases. These gases only appear to increase the fundamental electronic discharge from the hot kathode by a process involving the occurrence of ionisation by collisions.

The foregoing explanation of Mr. Soddy's result is only offered as a suggestion, for two reasons. In the first place, Mr. Soddy's letter is not sufficiently definite as to some of the salient facts, as, for example, the magnitude of the pressure before the current dropped. In the second place, there is a good deal about the behaviour of these Wehnelt kathodes which is imperfectly understood, and which merits further investigation.

O. W. RICHARDSON.

Princeton, N.J., December 7, 1907.

I AM glad to learn Prof. Richardson's view is much the same as that expressed in my letter to NATURE of November 21, 1907, that the currents in question are carried mainly by the residual gas, not by the electrons expelled from the kathode. Into the views that have been expressed in earlier communications it is therefore un-